

NEW SPECIES OF *BACCHARIS* (ASTERACEAE: ASTEREEAE) FROM RIO DE JANEIRO STATE, SOUTHEASTERN BRAZIL

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ABSTRACT

Two new species of *Baccharis* from the state of Rio de Janeiro, southeastern Brazil, are described and illustrated. ***Baccharis altimontana*** Heiden, Baumgratz & Esteves, assigned to sect. *Caulopterae* DC., is characterized by the erect-patent branches, female capitulum with urceolate or campanulate involucre and uniseriate female pappus. The species is contrasted with morphologically close species of the “*Baccharis genistelloides* Complex.” ***Baccharis friburgensis***, assigned to sect. *Oblongifoliae* DC., is characterized by the coriaceous leaves with acute to obtuse apex, entire and revolute margin, corymbiform panicles, few-flowered male and female capitula and female florets with denticulate corolla apex, and those characteristics differentiate it from *B. macrophylla* Dusén. Additionally, keys to identify the species of sect. *Caulopterae* and sect. *Oblongifoliae* occurring in the state of Rio de Janeiro are provided.

RESUMO

Duas novas espécies de *Baccharis* do estado do Rio de Janeiro, sudeste do Brasil, são descritas e ilustradas. ***Baccharis altimontana*** Heiden, Baumgratz & Esteves, pertencente à sect. *Caulopterae* DC., é caracterizada pelos ramos ereto-patentes, capítulo feminino com invólucro urceolado ou campanulado e papilho das flores femininas unisseriado, a espécie é comparada com outras morfologicamente próximas do “Complexo *Baccharis genistelloides*.” ***Baccharis friburgensis*** Heiden, Baumgratz & Esteves, pertencente à sect. *Oblongifoliae* DC., é caracterizada pelas folhas coriáceas, com ápice agudo ou obtuso, margem inteira e revoluta, panículas corimbiformes, capítulos masculinos e femininos paucifloros e flores femininas com ápice da corola denticulado, características que a diferenciam de *B. macrophylla* Dusén, espécie morfologicamente similar. Adicionalmente, são fornecidas chaves para determinação das espécies das seções *Caulopterae* e *Oblongifoliae* ocorrentes no estado do Rio de Janeiro.

INTRODUCTION

Baccharis was never revised taxonomically as a whole. The last worldwide compilation of accepted scientific names and synonyms of the genus was published by Malagarriga (1977). Following Müller (2006), infrageneric classification of *Baccharis* is still not well resolved, and, additionally due to the high species number, revisionary work in the genus is only possible with a geographical approach. For Brazil, the last revisionary work of the genus was provided by Barroso (1976), comprising 125 species. Later, Oliveira et al. (2006) published a compilation of 146 names, without citing vouchers to assure some occurrences of species not listed by Barroso (1976) in the country. The genus occurs in all Brazilian biomes and most of its species are concentrated in the central and eastern regions of the country, growing mainly in savannas (*cerrado*) and grasslands (*campos de altitude*, *campos rupestres* and *campos sulinos*). For the state of Rio de Janeiro information concerning the genus is available only in geographically restricted florulas (Barroso 1957, 1959; Esteves & Barroso 1996) or in the taxonomic revision for Brazil (Barroso 1976).

During the taxonomic revision of *Baccharis* for the flora of the state of Rio de Janeiro two new species belonging to the sect. *Caulopterae* DC. and sect. *Oblongifoliae* DC. were recognized. These new species are described and illustrated, and keys to identify the species of these sections occurring in Rio de Janeiro state are presented.

MATERIAL AND METHODS

The study has been based on literature revision and the examination of material or photos from herbaria GUA, HAS, HB, HBR, HPNI, HRJ, M, P, R, RB, RBR, RFFP, RUSU and SP. Specimens of the related taxa contrasted to the new taxa are cited just after the description and before the keys. The terminology used in the morphological descriptions is based on Radford et al. (1974) and Müller (2006). The measures were taken by the mean of a digital calliper in the wider portion of the structures. All colours mentioned are of dried mature structures. The illustrations were prepared by stereomicroscopy using a Carl Zeiss Stemi SV6. The conservation status is presented following the IUCN (2001) guidelines.

TAXONOMY

Baccharis altimontana Heiden, Baumgratz & Esteves, sp. nov. (**Fig. 1**). TYPE: BRAZIL: RIO DE JANEIRO: Teresópolis, Serra dos Órgãos, 27 Nov 1933, ♀ *Brade* 12510 (HOLOTYPE: R!).

Ad *Baccharis* sect. *Caulopterae* DC. pertinens, *B. genistelloides* (Lam.) Pers. subsp. *genistelloides* similis sed ramis erecti-patentibus (non erectis) munitis, corolla florum masculinorum 2.9–4 mm longis (non 4–6 mm longis), corolla florum foemineorum 2.5–3.4 mm longis (non 3.5–6.8 mm longis), et pappi florum foemineorum uniseriati (non multiseriati) munito differt.

Dioecious subshrubs 0.2–0.4 m tall, erect-patent or prostrate. **Stems** and branches 3-winged, wings 0.5–6.5 cm long, 0.3–1.6 cm wide, plane to undulate, strongly resinous, seemingly glabrous, indument tufted, tufts appearing under magnification as small resinous dots. **Leaves** 0.3–2 mm long, 0.2–0.5 mm wide, bract-like. **Panicles** 18–24 cm long, of pseudospikes 3–18 cm long, capitula solitary or 2–3, sparsely along the axis, the main pseudospike longer than the axillary ones. **Male capitula** 4–5.5 mm long, involucre 4.4–6.5 mm long, 4–6.8 mm wide, urceolate to campanulate; pyllaries in 5–8 series, abaxial surface pale yellow to dark, outer and median phyllaries ovate, inner elliptical, apex entire or denticulate, margins light yellow, denticulate, scarious; clinanthium obconical, plane, alveolate, densely covered by biseriate trichomes. **Male florets** 35–63; corolla 2.9–4 mm long, 5-laciniate, tube 1.8–2.5 mm long, throat 0.2–0.4 mm long, cup-shaped, lobes 1–1.4 mm long, externally with sparse biseriate trichomes on the throat and tube; styles 3.2–4 mm long, apex 1/2-bifidous; pappus 3.2–4.2 mm long, uniseriate, apex slightly broadened, terminal cell ends slightly protruding. **Female capitula** 6.5–8 mm long; involucre 4.4–6.5 mm long, 4–6.8 mm wide, urceolate to campanulate; phyllaries in 6–9 series, abaxial surface pale yellow to dark brown or olive green, outer ovate, median ovate to elliptical, internal elliptical, apex entire or denticulate, margins light yellow, denticulate, scarious; clinanthium obconical, alveolate, densely covered by biseriate glandular trichomes, paleae absent. **Female florets** 34–42; corolla 2.5–3.4 mm long, filiform, apex shortly ligulate, 3–5 teeth of unequal size; styles 3.1–5.1 mm long, branches 0.5–0.8 mm long. **Cypselae** 1.2–1.5 mm long, cylindrical, glabrous, papillose, 16–22-ribbed; pappus 4–4.7 mm long, uniseriate, not-acrescent.

Specimens examined. **BRAZIL. Rio de Janeiro:** Itatiaia, 4 Nov 1965, Eiten 6612 (RB); 12 Sep 2007, Heiden & Baumgratz 823 (RB); 17 Dec 2007, Heiden 932, 933 (RB); 13 Apr 2008, Heiden 994 (RB); 18 Oct 1977, Landrum 2103 (RB); 5 Dec 1964, Vianna 207 (GUA, RB). **Nova Friburgo:** 22 Mar 2008, Heiden & Baumgratz 711 (K, RB). **Teresópolis:** 27 Jun 2007, Heiden 791, 792 (RB); 26 Sep 2007, Heiden 879, 880 (RB); 21 Mar 2007, Nadruz 1772 (RB); 6 Sep 1981, Ribeiro 138 (GUA); Jan 1952, Vidal II-173, II-175 (R); 12 Feb 1952, Vidal II-551 (R) Feb 1952, Vidal II-662 (R); 15–20 Dec 1952, Vidal II-5768 (R); Feb 1953, Vidal 1478 (R).

Distribution & ecology.—*Baccharis altimontana* is restricted to southeastern Brazil, known up to now only from the state of Rio de Janeiro. It occurs in the Atlantic Rain Forest biome, above 1900 m, in the massifs of Itatiaia (Serra da Mantiqueira), Serra dos Órgãos, Pico da Caledônia and Pico do Desengano (all of them belonging to the Serra do Mar). It grows in rather small populations in rock grooves on bare rock outcrops along the high altitude grasslands, preferably in places with constant wetness. Flowering and fruiting time is between September and December.

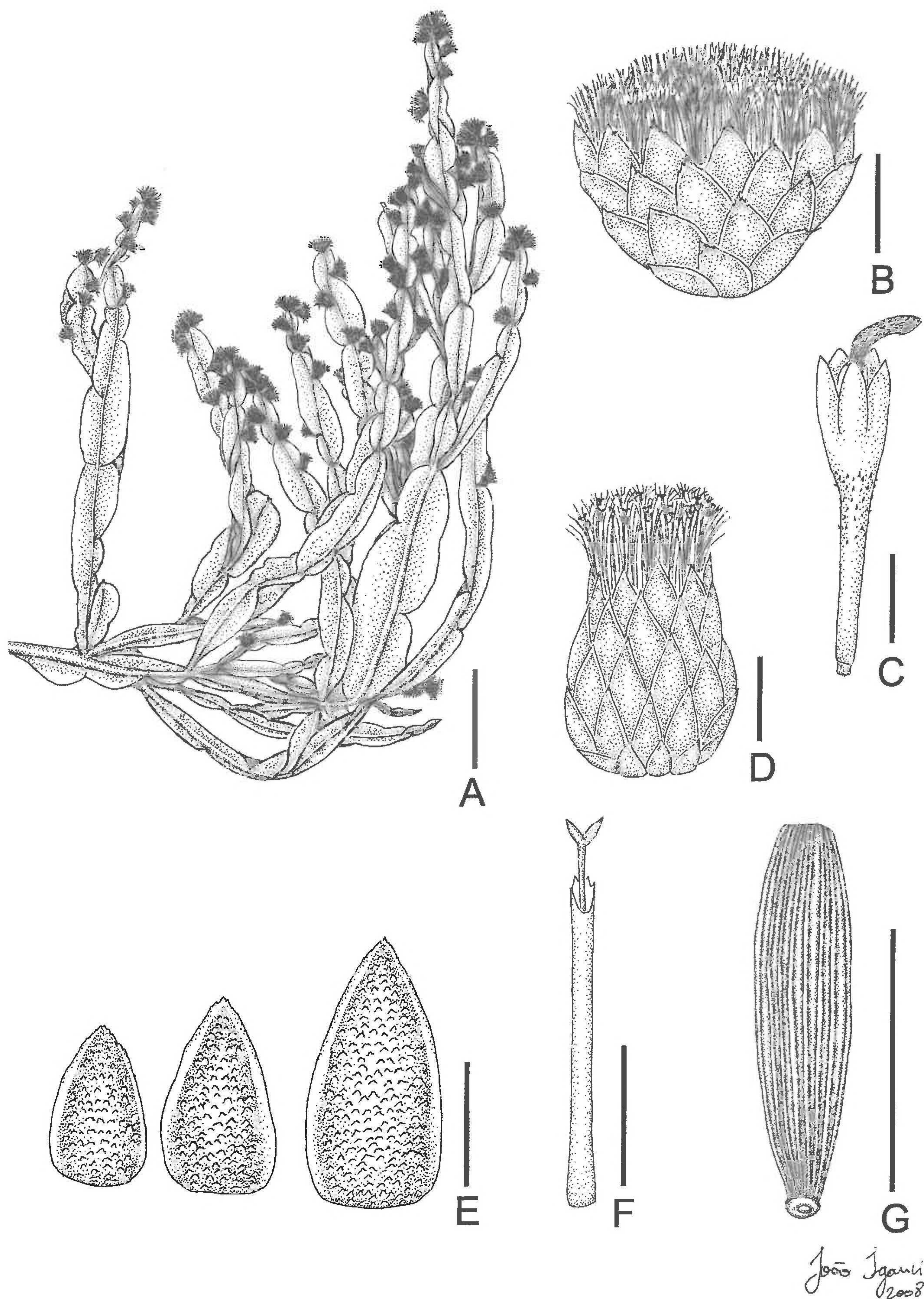


FIG. 1. *Baccharis altimontana* Heiden, Baumgratz & Esteves: A. Habit of female plant; B. Male capitulum; C. Male floret (pappus removed); D. Female capitulum; E. Phyllaries from female capitulum; F. Female corolla and style; G. Cypsel. Scale bar near A: 3 cm; B, D: 2 mm; C, E, F, G: 1 mm. (A: *Brade* 12510; B, C: *Heiden* 879; D, E, F, G *Heiden* 823). Drawn by João Iganci.

Vernacular.—Carqueja (Ribeiro 138; Heiden 711, 791, 792, 823, 879, 880, 932, 933, 994).

Conservation.—Common in high altitude grasslands, the species is considered near threatened (NT) due to the loss of quality of the mountainous environments caused by anthropogenic pressures.

Etymology.—The name refers to the habitat along the summits of mountain ranges.

Notes.—*Baccharis altimontana* is assigned to the sect. *Caulopterae* DC., mainly due to presence of winged stems, epaleaceous clinanthia densely covered with biseriate glandular hairs, papillose glabrous achenes, and pappus bristles of female flowers enlarged basally and fused into a ring. The species belongs to the “*Baccharis genistelloides* Complex” comprising at least eight morphologically close taxa [*B. crispa* Spreng., *B. genistelloides* (Lam.) Pers. subsp. *genistelloides*, *B. genistelloides* subsp. *lorentzii* Joch. Müll., *B. jocheniana* Heiden & Macias, *B. myriocephala* DC., *B. opuntiioides* Mart. ex Baker and *B. riograndensis* Malag. & J. E. Vidal]. The new taxon is closer related to *Baccharis genistelloides* subsp. *genistelloides*, which occurs along the Andes from Colombia to northern Chile and Bolivia (Müller 2006). The studied specimens of *B. altimontana* were found in herbaria identified as *B. crispa*, *B. genistelloides*, *B. myriocephala*, *B. opuntiioides* or *B. trimera* (= *B. crispa*).

Baccharis altimontana may be distinguished of *B. genistelloides* subsp. *genistelloides* by male corollas 2.9–4 mm long, female corollas 2.5–3.4 mm long and female florets with uniseriate pappus (vs. male corollas 4–6 mm long, female corollas 3.5–6.8 mm long and female florets with multiseriate pappus).

Specimens of *B. altimontana* are commonly identified as *B. opuntiioides*, since Barroso (1976) merged both species in a broad circumscription of *B. opuntiioides*. However, we consider *B. opuntiioides* as endemic to the Serra do Caparaó at the boundary between the states of Espírito Santo and Minas Gerais. This species may be recognized by erect branches with short wings, 0.3–1.8 cm long and 0.2–0.8 cm wide, pseudospikes with apically crowded capitula (in the apical 1–2.5 cm), with the secondary branches longer than the main axis of the capitulescence, male corolla 4–5.2 mm long, female corolla 4.2–5 mm long and cypselae 0.8–1 mm long.

Baccharis altimontana may be distinguished from *B. crispa* by erectopate or prostrate stems and shortly ligulate corollas of female florets with teeth of irregular size (vs. erect stems, corolla of female florets truncate or denticulate), and from *B. myriocephala* by the height (0.2–0.4 m tall), panicles 18–24 cm long with pseudospikes 3–18 cm long, involucre of female capitulum urceolate to campanulate (vs. height 100–250 cm, panicles 25–80 cm long, pseudospikes 10–35 cm long and involucre of female capitulum cylindrical).

Selected additional specimens:

Baccharis crispa Spreng., Syst. veg. 3:466. 1826. **BRAZIL. Rio de Janeiro:** Itatiaia, 13 Apr 2008, Heiden 978, 993 (RB); Mar 1894, Ule 177 (R); Resende, 12 Nov 2007, Heiden & Baumgratz 815 (RB); 13 Sep 2007, Heiden & Baumgratz 833, 834, 850, 851 (RB). **URUGUAY. Montevideo:** 1821/1822, Sellow d397 (isotype: R).

Baccharis genistelloides (Lam.) Pers., Syn. pl. 2:425. 1807. **BOLIVIA. Santa Cruz:** 13 Nov 1959, Maguire & Maguire 44496 (RB). **EQUADOR. Cotopaxi:** “province de Tacunga,” Jussieu s.n. (P-Lam, photo of holotype). **Pichincha:** San Juan, 28 Nov 1952, Fagerlind & Wibom 1556 (R).

Baccharis myriocephala DC., Prodr. 5:426. 1836. **BRAZIL. Minas Gerais:** Vauthier 265 (G-DC, photo of lectotype). **Rio de Janeiro:** Miguel Pereira, 18 Apr 2007, Heiden & Baumgratz 727 (RB). Resende, 26 Jul 1966, Eiten 7447 (RB); 12 Nov 2007, Heiden & Baumgratz 802, 803 (RB); Rio de Janeiro, Jun 2000, Esteves & Esteves 462 (RB); Santa Maria Madalena, 14 May 2007, Heiden 734, 735 (RB); Teresópolis, 27 Jun 2007, Heiden 779, 780 (RB); 26 Oct 2007, Heiden 878 (RB).

Baccharis opuntiioides Mart. ex Baker in Martius, Eichler & Urban, Fl. bras. 6(3):39. 1836. **BRAZIL. Espírito Santo/Minas Gerais:** Caparaó, 15 Nov 1960, Flaster 101 (GUA); Nov 1922, Lobo s.n. (R 37944); 8–12 Mar 1917, Lutz 1197 (R); Martius s.n. (M, photo of holotype); 21 Oct 1947, Moreira 44 (R); 11 Jul 1998, Oliveira 1468 (GUA); 29 Jun 1950, Santos s.n. (R 52182); 2 Jul 1888, Schwacke s.n. (R 37949).

KEY TO BACCHARIS SECT. CAULOPTERAE IN RIO DE JANEIRO STATE, BRAZIL

1. Stems apterous.
 2. Leaf blades coriaceous, margins entire, with 3 acrodromous basal veins; panicles 1.5–6 cm long _____ **B. organensis**
 2. Leaf blades cartaceous, margins crenulate, pinnately veined or with 3 acrodromous 1–5 mm distant from leaf base suprabasal veins; panicles 4–16 cm long _____ **B. regnellii**
1. Stems winged.
 3. Leaves well-developed.
 4. Subshrubs (0.5–1 m tall); pseudospike branches 5–20 cm long _____ **B. junciformis**

- 4. Shrubs (0.5–3 m tall); pseudospike branches 0.5–5 cm long.
- 5. Wings 1–3 mm wide; leaf blades coriaceous, with attenuate base _____ **B. burchellii**
- 5. Wings 5–13 mm wide; leaf blades papiraceous, with cuneate or rounded base _____ **B. glaziovii**
- 3. Leaves bract-like.
- 6. Branches erect; female corolla apex truncate or irregularly denticulate _____ **B. crispa**
- 6. Branches erectopatent, scandent, decumbent and/or erect-prostrate; female corolla apex short ligulate.
- 7. Subshrub 0.2–0.4 m tall; pseudospikes 3–18 cm long; capitula solitary or 2–3; involucre of female capitulum urceolate to campanulate _____ **B. altimontana**
- 7. Subshrub 1–2.5 m tall; pseudospikes 10–35 cm long; capitula solitary or glomerules with 2–8 capitula; involucre of female capitulum cylindrical _____ **B. myriocephala**

Baccharis friburgensis Heiden, Baumgratz & Esteves, sp. nov. (**Fig. 2**). TYPE: BRAZIL: RIO DE JANEIRO: Nova Friburgo, Macaé de Cima, 16 Aug 1989, ♂, *Vieira* 48 (HOLOTYPE: RB!; ISOTYPES: FCAB!, GUA!, NY, RI, RB!, RBR!, SP!).

Ad *Baccharis* sect. *Oblongifoliae* DC. *pertinens*, *B. macrophyllae* Dusén habitu, foliorum coriaceo, inflorescentia in corymbis contracta similis, sed capitulis foemineis 2 ad 3 floribus (non 11 ad 21 floribus) munitis, corolla florum foemineorum apice dentato (non ligulato), et capitulo masculo 8 ad 12 floribus (non 30 ad 45 floribus) munito differt.

Dioecious shrubs 1.5–2 m tall. **Stems** erect, branching dichotomous, shoots glabrescent, with uniseriate and pedestal trichomes. **Leaves** spirally alternate, crowded at the apex of the branches, with petioles 0.2–0.8 cm long; blades 30–68 mm long, 7–21 mm wide, coriaceous, narrowly elliptic or oblanceolate to obovate, base attenuate, apex acute to obtuse, margins entire, revolute; pinnately veined; both surfaces seemingly glabrous, abaxial surface with tufted indument appearing as resinous dots, scarce biseriate, uniseriate and pedestal trichomes among the tufts. **Panicles** 1.9–4.4 cm long, 1.8–5.5 cm wide, corymbose, terminal; peduncles 1–1.8 cm long. **Male capitula** 2.9–4.8 mm long, involucre 2.9–4.8 mm long, cup-shaped, 2.7–5 mm wide; phyllaries in 3–5 series, brown, outer and median phyllaries ovate, inner linear-ovate, apex fimbriate, margins light-brown, shortly dentate; clinanthium convex, glabrous; paleae absent. **Male florets** 8–12, apex 5-laciniate; corolla 2.3–2.5 mm long., tube 0.9–1.1 mm long, externally densely covered by biseriate trichomes near the apex, throat 0.5–0.6 mm long, cup-shaped, lobes 0.7–0.8 mm long, apex not revolute; anthers included; styles 2.4–2.6 mm long, apex capitate by sweeping hairs of unequal size, slightly exserted; sterile ovary 0.5–0.7 mm long; pappus 2–2.3 mm long, uniseriate, apex broadened, cell ends erectopatent, shortly protruding. **Female capitula** 5.3–5.8 mm long, involucre 4.3–5 mm long, 2.2–3.1 mm wide, cylindrical; phyllaries in 4–6 series, brown, outer phyllaries ovate, median linear-ovate, inner linear, apex long-fimbriate, margins light-brown, shortly dentate; clinanthium convex, paleae linear, acute, deciduous. **Female florets** 2–3, filiform; corolla 2.9–3.2 mm long, apex 5-denticulate, distal half with subapical scattered biseriate trichomes; styles 3–3.5 mm long., branches 0.3–0.6 mm long. **Cypselae** 2–2.6 mm long, 0.4–0.6 mm wide, light brown, cylindric, narrowed at both extremities, with 5–6 longitudinal ribs, with scattered biseriate trichomes near the apex; pappus 2.5–3 mm long, slightly shorter to slightly longer than the style, biseriate, persistent, not accrescent at maturity.

Additional specimens examined. **BRAZIL. Rio de Janeiro:** Nova Friburgo, ♀, 24 Aug 1986, *Leitman* 196 (K n.v.; RB-2x); ♂, 19 Aug 1990, *Moraes* 414 (RB-2x).

Distribution & ecology.—Restricted to southeast Brazil (state of Rio de Janeiro). It occurs in the Atlantic Rain Forest biome, from 1000 to 1500 m above sea level, and is endemic to the summits of the Macaé de Cima Mountains, a part of the Organ Mountains/Serra do Mar Ranges. It grows directly on rock outcrops, along river headwaters or in edges of nebular forest. Flowering and fruiting in August.

Conservation.—Taking into account the few collections available, the restricted area of occurrence and the presence of anthropogenic pressure in surrounding areas, represented by cattle grazing, agriculture, tourism and urban expansion, the species is considered endangered (EN B2ab[iii]).

Etymology.—The name refers to the type locality in the municipality of Nova Friburgo.

Notes.—*Baccharis friburgensis* is assigned to sect. *Oblongifoliae* DC. for the pinnately veined leaves, capitate style apex in male flowers due to sweeping hairs of unequal size, paleate female capitula and female flowers with the pappus not elongated at cypsela maturity. The species is remarkable for the few-flowered

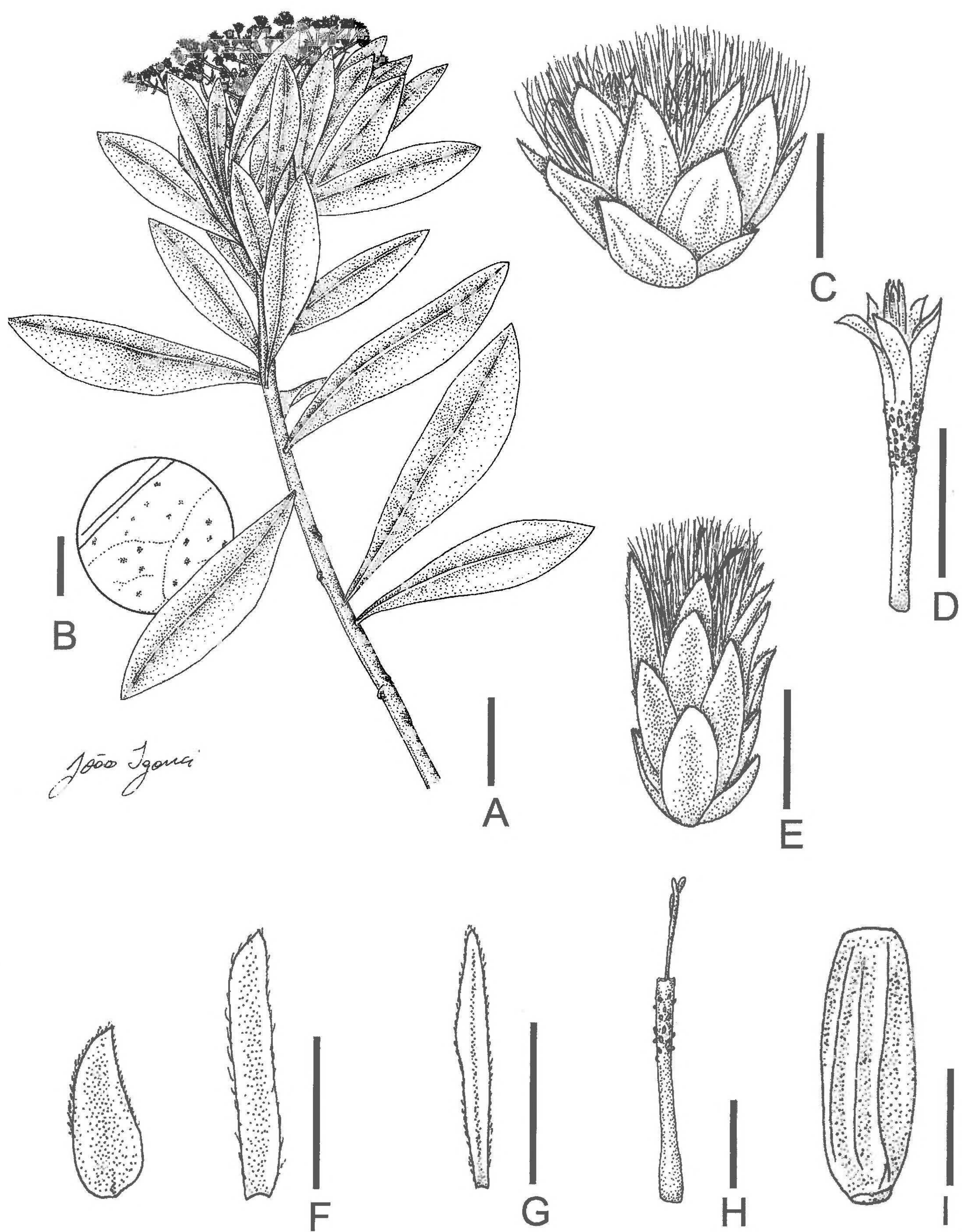


FIG. 2. *Baccharis friburgensis* Heiden, Baumgratz & Esteves: A. Branch of female plant; B. Abaxial leaf surface; C. Male capitulum; D. Male floret (pappus and sterile ovary removed); E. Female capitulum; F. Phyllaries from female capitulum; G. Palea; H. Female corolla and style; I. Cypsel. Scale bar near A: 2 cm; B, D, F, G, H, I: 1 mm; C, E: 2 mm (A, B, E, F, G, H, I: Leitman 196; C, D: Vieira 48). Drawn by João Iganci.

male (8–12) and female (2–3) capitula, which results in seemingly epaleaceous female clinanthia, because all paleae are, due to the low flower number, more distal than the distalmost flowers and hidden by the innermost phyllary series. Some further distinguishable characters are the coriaceous leaves with acute to obtuse apex, entire and revolute margins, and the corymbose panicles. *Baccharis friburgensis* is vegetative morphologically similar to the allopatric *B. macrophylla* Dusén, although this similarity seems to be a convergence to the habitat in sunny habitats on summits of mountains. The later one has leaf margin more commonly with 1–5 subapical teeth, seldom entire, male capitula with 30–45 flowers, female capitulum with 11–21 flowers, and female corollas ligulate.

Selected additional specimens:

Baccharis macrophylla Dusén, Arq. Mus. Nac. Rio de Janeiro 13:14. 1905. **BRAZIL. Rio de Janeiro:** Itatiaia, Dusén 4844 (HOLOTYPE: R); 23 Jul 1960, *Handro* 941 (SP); 17 Dec 2007, *Heiden* 930 (RB); 16 Aug 1969, *Sucre* 5775 (CEPEC); s.d., *Tamandaré & Brade* 6562 (SP); Resende, 12 Sep 2007, *Heiden & Baumgratz* 827, 828 (RB); Jul 1902, *Moreira & Teixeira* s.n. (R 38027).

KEY TO *BACCHARIS* SECT. *OBLONGIFOLIAE* IN RIO DE JANEIRO STATE, BRAZIL

- 1. Panicles pyramidal.
 - 2. Foliar indument ferruginous _____ ***B. rufidula***
 - 2. Foliar indument not ferruginous _____ ***B. oblongifolia***
- 1. Panicles corymbose.
 - 3. Leaf blade papyraceous, margins not revolute _____ ***B. grandimucronata***
 - 3. Leaf blade coriaceous, margins revolute.
 - 4. Male capitula 30–45 florets; female capitula 11–21 florets, female corollas with ligulate apex _____ ***B. macrophylla***
 - 4. Male capitula 8–20 florets; female capitula 3–8 florets, female corollas with denticulate apex _____ ***B. friburgensis***

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